

THE UNIVERSITY OF TEXAS AT AUSTIN

Date: September 5, 2013**RECOMMENDATION FOR CHANGE IN ACADEMIC RANK/STATUS**Name: J. Eric BickelPresent Rank: Assistant Professor

Years of Academic Service (Include AY 2013-14 in each count):

At UT Austin since: 9/1/08 In present rank: 6 years ; In Probationary Status (TT only): 6 years
(m/d/y) (# of years) (# of years)Department: Mechanical EngineeringOther: Operations Research/Industrial EngineeringCollege/School: Cockrell School of Engineering**Recommended action¹:**By Budget Council/Executive Committee: PromoteVote² for promotion 29 ; Against 0 ; Abstain 0 ; Absent 7By Department Chair: Promote

By SBS Executive Committee: _____

Vote² for promotion _____ ; Against _____ ; Abstain _____ ; Absent _____

By Director: _____

By College/School Advisory Committee: PromoteVote² for promotion 7 ; Against 0 ; Abstain 0 ; Absent 0By Dean: PromoteAdministrative Action: Promote to Associate ProfessorDate Action Effective: September 1, 2014

(To be submitted to the Board of Regents as part of the annual budget.)

By: _____

For the President

Date: 12/16/2013¹See "Chart of Recommended Actions" for eligible recommended actions applicable to specific conditions and administrative levels.²All votes are to be recorded as For, Against, or Abstain. (Note: unexplained abstentions will be interpreted as weak negative votes by the President's Committee.) Also record number of absent eligible voting members.

EVPP/4.13

EXHIBIT
P's 170

Dean's Assessment
James Eric Bickel
 Department of Mechanical Engineering

J. Eric Bickel received his BS degree in Mechanical Engineering from New Mexico State University in 1993. He received his MS and PhD degrees in Engineering-Economic Systems from Stanford University in 1994 and 1999, respectively. After completing his PhD, he spent five years as a consultant with Strategic Decisions Group in Houston and four years as an assistant professor in the Department of Industrial and Systems Engineering at Texas A&M University. He joined the faculty at UT Austin in 2008 as an assistant professor in the Department of Mechanical Engineering as part of the graduate program in Operations Research/Industrial Engineering.

Ten external review letters were submitted as part of the promotion dossier, four were suggested by the candidate and six were selected by the budget council. All reviewers are current or emeritus faculty members at US universities and one is a Nobel Laureate in Economics and a member of the National Academy of Sciences and the Institute of Medicine. Three other reviewers, selected by the candidate, declined without any negative implication.

Teaching

Dr. Bickel has taught one undergraduate course in mechanical engineering and two graduate courses in operations research and industrial engineering: ME 353, *Engineering Finance* (six times); ORI 397, *Introduction to Decision Analysis* (five times); and ORI 390.R, *Applied Probability* (three times). His average overall instructor/course ratings for these courses are 3.6/3.4, 4.4/4.2 and 4.3/4.1 respectively.

As a baseline for comparison the average weighted (by class size) overall instructor ratings for undergraduate and graduate courses for assistant professors in Mechanical Engineering are 4.0 and 4.2 respectively. Comparing Dr. Bickel's overall instructor rating to that of other faculty teaching ME 353, one finds that his ratings are quite good. In fact, his last evaluations of 4.5/4.2 for Spring 2013 are among the best in the recent past. The in-class peer evaluations and student comments confirm that his teaching is good and continues to improve.

In addition, Dr. Bickel has led the development a Management Science and Engineering certificate program in the Department of Mechanical Engineering. This is aimed at encouraging engineering students to not only develop a focus in this topic area, but to pursue a research project encouraging top students to eventually attend graduate school. Dr. Bickel also co-led a week long course at Stanford University for the Decision Education Foundation targeting high-school teachers and adult mentors of at-risk youth. He developed two professional education courses in *Decision Quality* and *Decision Leadership* which he taught to executives and managers in the energy industry in 2011.

Research

Dr. Bickel's research focuses on the theory and practice of decision analysis under uncertainty, with applications to climate change and energy exploration. In particular his recent work has focused on the development of new methodologies for probability-based decision-making. He has several recognized contributions including new approaches to the discretization of continuous distributions to support efficient computation, and representation of partial information and joint distributions. Also of note are his publications bringing rigor and uncertainty modeling and analysis to bear on questions in climate change.

In rank at UT, he has published 24 refereed journal papers, two refereed conference publications, and six book chapters. He has 30 refereed journal papers in his career.

Dr. Bickel has secured \$4.0 million in research funding in rank at UT (his share is \$1.45 million). He served as the principal investigator on eleven of the fifteen grants/contracts, which include a very diverse set of sponsors from federal sources (National Science Foundation and Department of Energy) and industry (BP America and Schlumberger). Dr. Bickel received a CAREER award from the National Science Foundation in 2010.

The external reviewers' assessment of Dr. Bickel's research speak to his creativity, the potential practical impact of his published work, and his leadership and service to the field. Representative highlights include:

Dr. Thomas Schelling (University of Maryland and Harvard University, Nobel Prize, NAS, IOM) writes, "I find Eric Bickel to be as imaginative, insightful, and original on geoengineering as any expert I know in the field. He has produced ideas that others have not originated. His professional background in statistics and probability is, as far as I know, unique in the field. He is a policy thinker. Others contribute more to their particular sciences—atmosphere, chemistry or physics, agronomy, oceanology [sic] - but Bickel is almost unique in his ability to identify crucial issues in the possibl[e] governance of either experiments or possible ultimate deployment of any effort at managing solar radiation."

Dr. Katherine Ensor (Rice University) writes, "Dr. Bickel has clearly established himself as a leading scholar in decision analysis. He is extremely well published, well funded and a strong contributor to the community through his editorships, conference participations and invited speaking opportunities. Further, his ties to the corporate community are a strong indicator of the relevance of his research to leading global corporations. Dr. Bickel is clearly a leader as evidenced by his initiation of the joint corporate outreach between the University of Texas and Stanford; simply impressive."

Dr. Stephen Pollock (University of Michigan) writes, "Professor Bickel's career trajectory is unusual for its acceleration, direction and consistency. Usually, when an Assistant Professor comes up for a tenure/promotion decision, the major question to be asked is whether the candidate *will* be the kind of colleague one would want to have for the rest of his/her academic career; whether the past accomplishments point towards a *future* of productivity and excellence. In Bickel's case, the questions are almost moot – he is *already* a person who one wants to have as a colleague for the infinite future, and his past accomplishments are *already* those one would expect to have in a full Professor."

Advising and Student Mentoring

While in rank, Dr. Bickel has graduated two PhD students and has three more in progress. One of his PhD advisees from Texas A&M has taken an academic position at the University of Alaska. Dr. Bickel has also graduated thirteen MS students and mentored four undergraduate students.

University Service

Dr. Bickel has served on a number of departmental committees related to the undergraduate curriculum and recruiting of graduate students.

Professional Service

Dr. Bickel has been very active in national and international professional activities. He has served as an associate editor and on the editorial board of *Decisional Analysis*, a flagship journal in his research area, and on the editorial board of the journal *EURO Journal of Decision Processes*. He is now the vice president/president-elect of the 1200-member Decision Analysis Society (DAS).

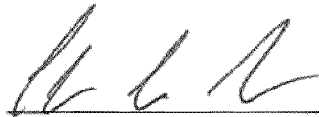
Other Evidence of Merit or Recognition

Dr. Bickel has received national and international recognition for his research. He received a CAREER Award from the National Science Foundation in 2010, he is an elected fellow of the Society of Decision Professionals, he is the vice president/president elect of the Decision Analysis Society, and he was invited to present to a distinguished panel of scientists and Nobel Prize winners at the Copenhagen Consensus on Climate Change in 2009.

Overall Assessment

Dr. Bickel has a well-rounded profile both as a researcher and teacher. He has made research contributions on the methodological side of decision analysis under uncertainty that are likely to have practical impact and he is recognized as a leader in the field. He has garnered substantial attention outside of academe for his work addressing questions in the area of climate change. His research output in terms of graduate student supervision and publications is strong.

Accordingly, I am pleased to provide a strong recommendation to promote J. Eric Bickel to associate professor with tenure.



Sharon L. Wood, Interim Dean
10 November 2013

BUDGET COUNCIL STATEMENT OF TEACHING

ERIC BICKEL

Overview and Principal Areas of Teaching

Dr. J. Eric Bickel is a member of the faculty in our Graduate Program in Operations Research & Industrial Engineering (ORIE) in the Mechanical Engineering Department (ME). He teaches core undergraduate courses in ME, and required and elective graduate courses in ORIE. Dr. Bickel believes that students at all levels of education—from high school students to undergraduate students to graduate students to professionals engaged in continuing education—should learn to think critically about making decisions in all aspects of their lives. This core belief drives Dr. Bickel's teaching activities. His students respond very well to Dr. Bickel's passion regarding the importance of learning decision making as a fundamental life skill.

Since joining our faculty in the 2008-2009 academic year, Dr. Bickel has taught one undergraduate course, ME 353 *Engineering Finance*, and two ORIE graduate courses, ORI 397 *Decision Analysis* and ORI 391Q.1 *Applied Probability*. Engineering Finance is a core undergraduate course in the ME curriculum. Decision Analysis is an elective course in ORIE in Dr. Bickel's primary area of research. Applied Probability is a required course for ORIE MS students, a topic on the ORIE PhD qualifying exam, and a topic on the ME interdisciplinary PhD qualifying exam. In Fall 2013, Dr. Bickel will teach a second ME core undergraduate course, ME 335 *Engineering Statistics*, due to the recent retirement of Prof. J. Wesley Barnes.

Evaluation Procedure

This statement is prepared by a member of the ME Budget Council, Dr. David Morton, Engineering Foundation Professor #1 and ORIE Coordinator. The statement is based on: (i) a review of student course-instructor surveys conducted at the end of each course; (ii) a review of Dr. Bickel's Teaching Portfolio, including course syllabi, homeworks, quizzes, case studies, and exams; (iii) a review of Dr. Bickel's promotion package including his Statement on Teaching and Statement on Advising, Counseling, and Other Student Services; (iv) five peer teaching evaluations from Spring 2011 through Spring 2013 in Decision Analysis and Engineering Finance; (v) a review of a draft of Dr. Bickel's NSF CAREER proposal, and (vi) joining Dr. Bickel's monthly research group meetings on several occasions. In Dr. Bickel's case, each peer teaching evaluation was carried out by Dr. Morton, and the timing of the evaluations was agreed upon ahead of time. There were no surprise visits by an evaluator.

Summary of Teaching Evaluations

The Overall Instructor Rating is used as the prime indicator from the Course Instructor Survey. (The Overall Course Rating is also a prime indicator, but in Dr. Bickel's case the course rating consistently lagged the instructor rating by 0.2 points, which is consistent with Department, School, and University lags.) Dr. Bickel taught the undergraduate core course Engineering Finance six times and received a rating of 3.65/5.0. This value is below ME, Cockrell School, and University averages of 4.0-4.2 over this timeframe. That said, Engineering Finance is a

challenging course to teach, and prior to Dr. Bickel joining our faculty, the instructor rating was substantially lower. Moreover, the two highest scores Dr. Bickel has received in ME 353 are in his two most recent offerings, including a Spring 2013 rating of 4.5.

Dr. Bickel's average instructor rating in Applied Probability is 4.3 and in Decision Analysis is 4.4. These are somewhat above Department, School, and University averages. Moreover, these are excellent ratings considering that these graduate courses have strong enrollments. The required graduate course Applied Probability averages about 35 students, and the elective course Decision Analysis averages nearly 30 students.

One section of the syllabus for each of Dr. Bickel's class includes a section called "Learning Environment." In that section, he encourages students to ask questions both in class, and outside of class, and to participate in classroom discussions. The section concludes with, "I want you to do well and am concerned about your performance. This material is important. Really!" The fact that the vast majority of students respond positively to Dr. Bickel's passion is clear from student evaluations.

Decision Analysis, Assessing Probabilities, and Engineering Practice

Decision Analysis is an elective course in the ORIE Program, and is a new course developed by Dr. Bickel. It is attended by students from programs in ORIE, Civil, Architectural & Environmental Engineering, Energy & Earth Resources, and Petroleum & Geosystems Engineering, among others. A key part of the field of decision analysis concerns eliciting probabilities from experts on the likelihood of competing hypotheses, a central notion in science and engineering. Dr. Bickel teaches methods for assessing such probabilities in Decision Analysis, and he does so early on in the course for reasons now explained. Exams in Decision Analysis involve multiple-choice questions, with responses a , b , c , and d . An answer to a question involves the student assigning probabilities p_a , p_b , p_c , and p_d , that each response is correct. These probabilities should be nonnegative, and sum to one. Exam grading is done using a logarithmic scoring rule, appropriately scaled and shifted. Assigning probability zero to a correct response yields a score of negative infinity for that specific question, and it is impossible to recover from such a score. This type of exam forces students to internalize the idea of a log-based utility function, to understand more deeply the notion of assigning probabilities to competing hypotheses, and to realize that this scoring rule yields a more informative test score than does the binary outcome of students simply selecting, and sometimes guessing, what they believe to be the correct response.

Exam scoring in Decision Analysis is representative of Dr. Bickel's teaching more broadly: He practices what he teaches and encourages (well, in the case of the Decision Analysis exams, requires) students to do so, too. To be sure, a few students complain in their instructor surveys saying, e.g., "Probabilistic grading is confusing." That said, the vast majority of students embrace this idea, in part because Dr. Bickel motivates it so well.

With the same motivation, Dr. Bickel has redesigned our undergraduate Engineering Finance course, to include a focus on decision making under uncertainty. Student survey responses in this course include, "I think this is one of the most important classes that engineers can take." And, "Dr. Bickel is one of the best professors I've had. He was very good about teaching us both what

he had to (the syllabus) and what he knew we should know for life (mortgages, time shares, solar panels, etc.).”

In Applied Probability and Decision Analysis, Dr. Bickel awards extra credit with each homework assignment if a student describes a newspaper or magazine article that has a discussion that would benefit from the analytical tools taught in the course. In Applied Probability, students read Nassim Taleb’s popular book, *Fooled by Randomness*, and write a report. Dr. Bickel makes demonstrating knowledge and applicability of the course material beyond the course fun and interesting.

Beyond Organized Teaching

As part of Dr. Bickel’s NSF CAREER grant, he proposed to create a certificate program in Management Science and Engineering for ME undergraduates. Three high-performing students have participated in this certificate program so far, which includes them taking at least one graduate-level course in ORIE and performing a research project with an ORIE faculty adviser. Dr. Bickel has used ME’s curriculum reform program called PROCEED to help fund his certificate program, offering fellowships to top applicants.

Dr. Bickel has worked with the Decision Education Foundation, which came out of Stanford University, to help teach high school teachers, and mentors, of at-risk youth how to teach their students decision-making skills. Dr. Bickel further worked with the University’s Center for Lifelong Engineering Education (CLEE) and Stanford’s Center for Professional Development to offer two courses in Stanford’s Strategic Decision and Risk Management Program. Dr. Bickel offered courses in *Decision Quality* and *Decision Leadership* to executives in Houston in December 2011, and he has plans to do so again in January 2014.

In Spring 2012, ORIE launched a new graduate course entitled *Applied Projects in ORIE (A PRIORI)*, and it has been taught twice so far. In Spring 2013, Dr. Bickel recruited DrillingInfo as an industrial sponsor of a student project, and he advised an interdisciplinary team of students from Petroleum & Geosystems Engineering and ORIE to work on that project. From speaking with Dr. Bickel, reviewing feedback from the industry sponsor, and speaking with the student team, the project was a success for all involved.

ORIE holds weekly graduate seminars, and the faculty rotate responsibility of organizing the seminar and inviting external speakers. When hosting the seminar, Dr. Bickel has invited a number of outstanding speakers including Shane Henderson (Cornell), Ralph Keeney (Duke), and Bonnie Ray (IBM).

Dr. Bickel has graduated two PhD students in ORIE, and graduated one from Texas A&M, prior to joining our faculty. He has two more PhD students in progress. Dr. Bickel has further graduated 13 MS students in his time at the University. In addition to individual weekly mentoring meetings with Dr. Bickel, his students benefit from a monthly research group meeting. I have joined that meeting on several occasions, and students have presented the current state of their research. On each occasion, faculty from the McCombs School of Business have also joined the meeting. And, often Dr. Bickel invites the visiting speaker from the ORIE Seminar Series to join, too, rather than simply meeting with Dr. Bickel individually.

Balance between Undergraduate and Graduate Teaching

Dr. Bickel has offered eight graduate courses and six undergraduate courses. This balance is more towards undergraduate offerings than most of the faculty in the Graduate Program in ORIE, where the bulk of our teaching responsibilities are at the graduate level. That said, Dr. Bickel has taught Decision Analysis each year while he has been in rank, and this helps feed his research program with MS and PhD students.

Willingness to Teach Courses with Strong Student Demand

Dr. Bickel has taught Engineering Finance six times in rank, and this course has typical enrollments of about 110 students. As indicated above, Dr. Bickel also teaches a required MS course in Applied Probability that averages about 35 students, many from outside ORIE, and his elective graduate course in Decision Analysis is popular (about 30 students), again with many students attending from outside the ORIE program. Dr. Bickel volunteered to teach Engineering Statistics in Fall 2013, upon the retirement of Prof. J. Wesley Barnes. Like Engineering Finance, this is a core course in the ME curriculum with typical enrollments of about 110 students.

Summary

Dr. Bickel is an excellent teacher. His strong teaching evaluations at the graduate level, and his good teaching evaluations in a challenging core undergraduate course both attest to this. Moreover, Dr. Bickel has significant teaching activity outside of organized courses, particularly for an assistant professor. The fact that his graduate classes are in demand, not only from students in ORIE but also from students across Engineering and elsewhere in the University, speaks to his reputation as an excellent teacher. The Graduate Program in Operations Research & Industrial Engineering, the Department of Mechanical Engineering, and the Cockrell School of Engineering are fortunate to have such a passionate and outstanding teacher and mentor in Dr. Bickel.



Dr. David P. Morton
Professor
Engineering Foundation Endowed Professor #1

September 3, 2013

Promotion Review
3b – Research

J. E. Bickel
Mechanical Engineering (ORIE)

Table 2 summarizes my grant and contract funding. While at UT, I have been a PI or Co-PI on over \$3.8 million in research funding, of which over \$1.2 million (32%) is my share.³ My research funding has come from a diverse set of sources including peer-reviewed funding from the National Science Foundation (6 and 9—including a CAREER award), the Research Partnership to Secure Energy for America (8), the National Energy Technology Laboratory (7), and the Department of Energy (2). Thus far, I have partnered with faculty in the Department of Petroleum and Geosystems Engineering, the Bureau of Economic Geology, the LBJ School of Public Affairs, and the Department of Petroleum Engineering at Texas A&M.

I have also actively sought internal funding opportunities and participated in the support of joint industry projects (JIPs). As shown in Table 3, I have obtained \$229,000 in such funding while at UT. As shown in Table 4, this brings my total funding while at UT to over \$4.0 million, with my share being almost \$1.5 million (36%).

TABLE 2: GRANTS AND CONTRACTS

#	PI	Co-PI(s)	Title	Sponsor	Peer Review	Grant Period	Amount	J. E. Bickel Share	
								%	\$
1	J.E. Bickel	None	Project 20K: Quantifying System Reliability to Inform Concept Selection	BP America Production Company	No	6/1/13-8/31/14	\$186,917	100%	\$186,917
2	V. Rai	J.E. Bickel (Sr Person)	Towards an Emergent Model of Tech. Adoption for Accel. the Diffusion of Residential Solar PV	Department of Energy Wells for Improved Recovery (Norway)	Yes	6/1/13-8/31/16	\$492,096	6%	\$29,526
3	J.E. Bickel	None	Real-time Steering Decision during Drilling		No	10/15/12-8/31/14	\$69,325	100%	\$69,325
4	E. Schneider	J.E. Bickel & D. Morton	Support for Risk-Informed Security Analysis Method w/ App. to Small Modular Reactors	Sandia National Labs	No	7/1/12-5/31/13	\$110,000	40%	\$44,000
5	J.E. Bickel	None	Quantifying the Benefit of CCS Monitoring and Verification Technologies	BP America Production Company	No	7/18/12-8/31/13	\$44,560	100%	\$44,560
6	J.E. Bickel	None	CAREER: Accurate and Efficient Modeling of Probabilistic Dependence	National Science Foundation	Yes	3/1/10-2/28/15	\$400,000	100%	\$400,000
7	I. Duncan	J. Nicot, C. Yang, J.E. Bickel	Developing Comprehensive Risk Assessment Frameworks for Geological Storage of CO2	Department of Energy—NETL	Yes	9/1/09-8/31/14	\$1,996,132	7%	\$142,406
8	D. McVay	J.E. Bickel	Optimizing Development Strategies to Increase Reserves in Unconventional Gas Reservoirs	to Secure Energy for America (DOE)	Yes	9/1/08-12/31/11	\$394,606	48%	\$188,602
9	J.E. Bickel	None	SGER: Resource Allocation and the Value of Information	National Science Foundation	Yes	9/1/08-12/31/10	\$120,000	100%	\$120,000
While at UT Austin							Sub-total	32%	\$1,225,336
10	J.E. Bickel	D. McVay, R. Gibson	Quantifying the Value of Seismic Information Phase 2	Schlumberger	No	9/1/06-8/31/07	\$125,000	60%	\$75,000
11	J.E. Bickel	D. McVay, R. Gibson	Quantifying the Value of Seismic Information	Schlumberger	No	9/1/05-8/31/06	\$50,000	60%	\$30,000
12	J.E. Bickel	None	Copulas and Energy Commodity Pricing	Suez Energy Marketing	No	1/1/05-5/31/05	\$15,000	100%	\$15,000
Grand Total							\$4,003,636	34%	\$1,345,336

TABLE 3: INTERNAL AND JOINT INDUSTRY PROJECT FUNDING SOURCES

#	PI	Co-PI(s)	Title	Sponsor	Peer Review	Period	Amount	J. E. Bickel Share	
								%	\$
13	J.E. Bickel	None	Applied Projects in OR Project Class	DrillingInfo	No	1/1/13-5/31/13	\$10,000	100%	\$10,000
14	J.E. Bickel	None	Center for Petroleum Asset Risk Management (CPARM) Membership	Weatherford International	No	9/1/12-8/31/13	\$50,000	100%	\$50,000
15	J.E. Bickel	None	Center for Petroleum Asset Risk Management (CPARM) Membership	Kuwait Oil Company	No	9/1/12-8/31/14	\$100,000	100%	\$100,000
16	J.E. Bickel	None	Management Science and Engineering Undergraduate Certificate Program	UT Austin (ME PROCEED Program)	No	4/1/10-8/31/15	\$20,000	100%	\$20,000
17	J.E. Bickel	None	Summer Research Assignment	UT Austin	Yes	6/1/09-7/31/09	\$25,000	100%	\$25,000
18	J.E. Bickel	None	Graduate School Diversity Mentoring Fellowship	UT Austin	Yes	9/1/09-8/31/10	\$24,000	100%	\$24,000
While at UT Austin							Sub-total	100%	\$229,000
19	J.E. Bickel	None	Pathways to Doctorate Program	Texas A&M	Yes	9/1/06-8/31/07	\$25,000	100%	\$25,000
Grand Total							\$254,000	100%	\$254,000

³ In one case (# 2 in Table 2) I am Senior Personnel, where my share is \$29,526. The \$394,606 grant from RPSEA (#8 in Table 2) includes \$80,000 in cost share from Pioneer Natural Resources; my share of \$188,602 includes \$40,000 of this cost share.